WideIOT

IOT Terminal

（WD140）

SPECIFICATION

WideIOT ● 2011

Product Introduction

The WD140 series of industrial data transmission terminals is an industrial - grade I/O data acquisition and LoRa transmission intelligent terminal. It supports optional 4G wireless transmission/LoRa wireless transmission, IO data acquisition, Modbus RTU protocol, and wireless 485 transparent transmission functions.

It supports 2 - channel analog input, 1 - channel digital input, and 1 - channel digital output (2AI, 1DI, 1DO). The data acquisition function can be read via the wired 232/485 serial port through Modbus RTU, via the power - adjustable wireless LoRa, and remotely via the 4G wireless network. It also supports the LoRa - to - serial - port transparent transmission function and the wireless 4G transparent transmission function. With its industrial - grade design, it is stable, reliable, and flexible for expansion, making it highly suitable for data acquisition in complex industrial environments, wireless transmission within 12KM, and 4G transmission in wide - area networks.

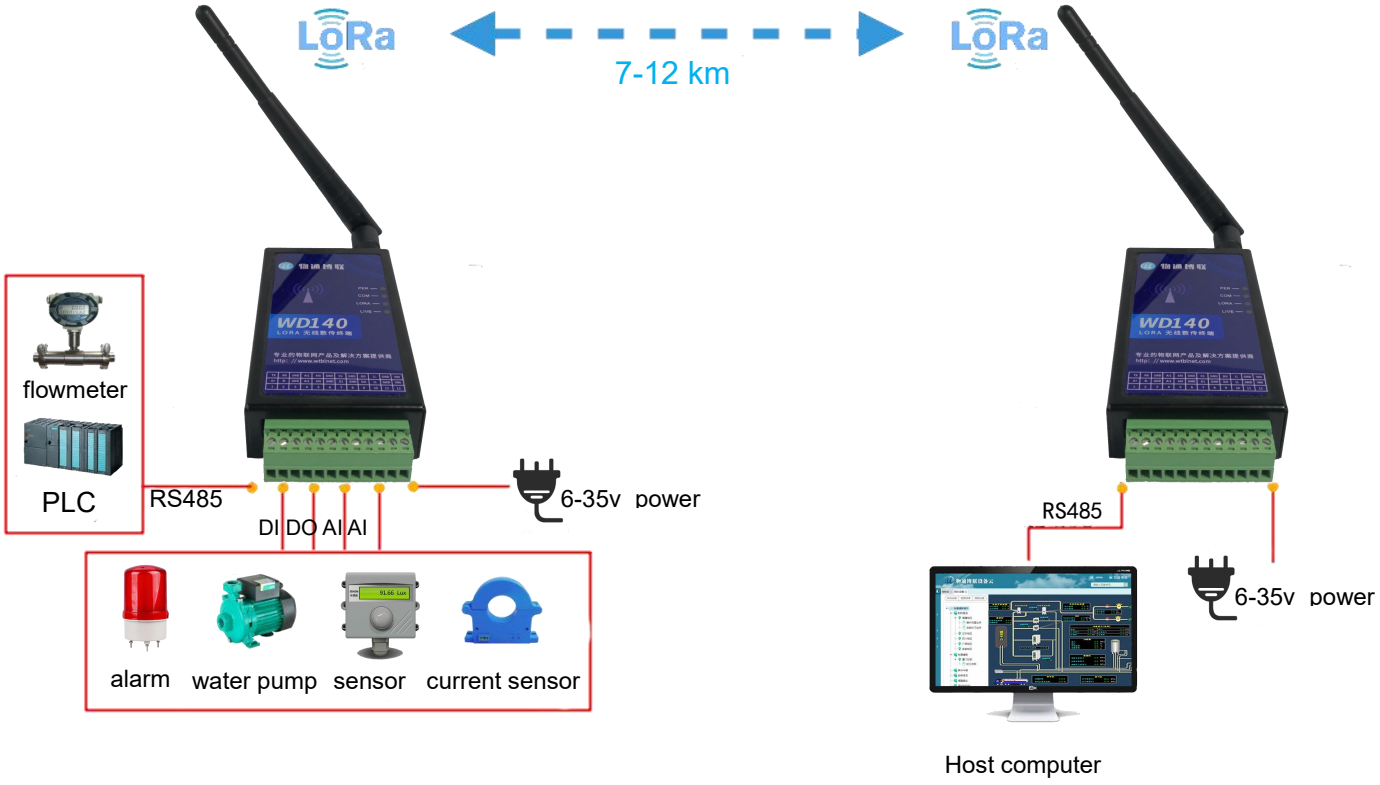
It is applicable to industries such as mines, oil wells, water conservancy monitoring, intelligent agriculture, intelligent transportation, intelligent factories, industrial control, building monitoring, the medical industry, and hotels.

Application Modes

One-to-One Wireless Transmission

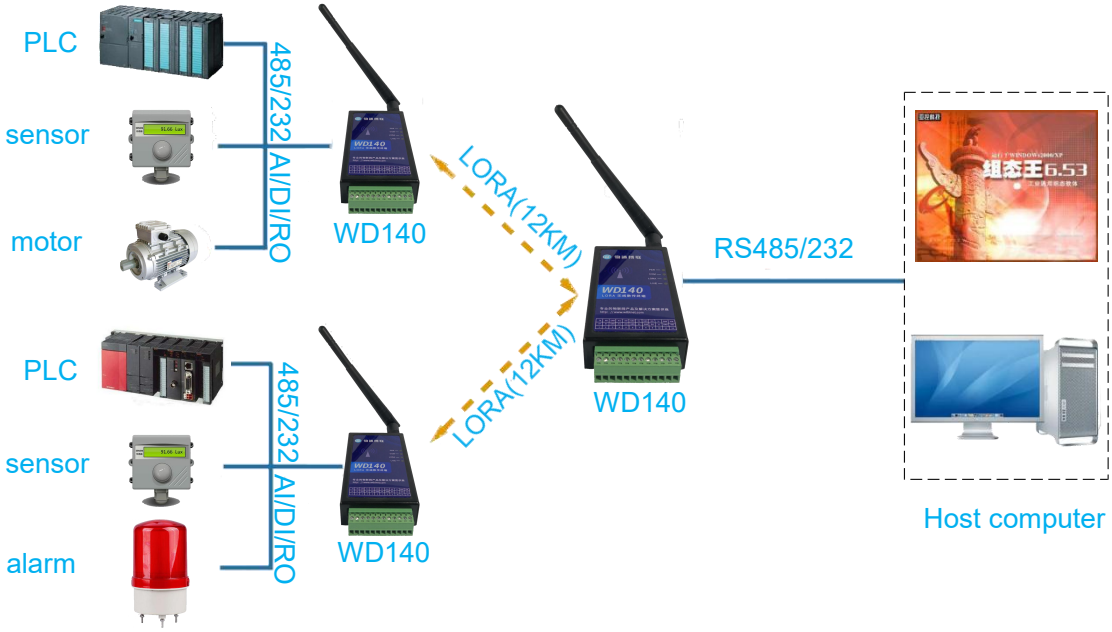
One-to-One transmission is one of the most commonly used modes. Through the LoRa wireless transparent transmission of two WD140s, data transmission and I/O acquisition can be achieved between two PLCs within a range of 12KM, between a PLC and a touch - screen, between a PLC and a PC, or between two other terminals.

The WD140 itself has analog acquisition, digital acquisition, and digital control functions. In some application scenarios, it can directly replace the PLC to achieve wireless I/O acquisition and control, which is not only easy to construct but also cost - saving.

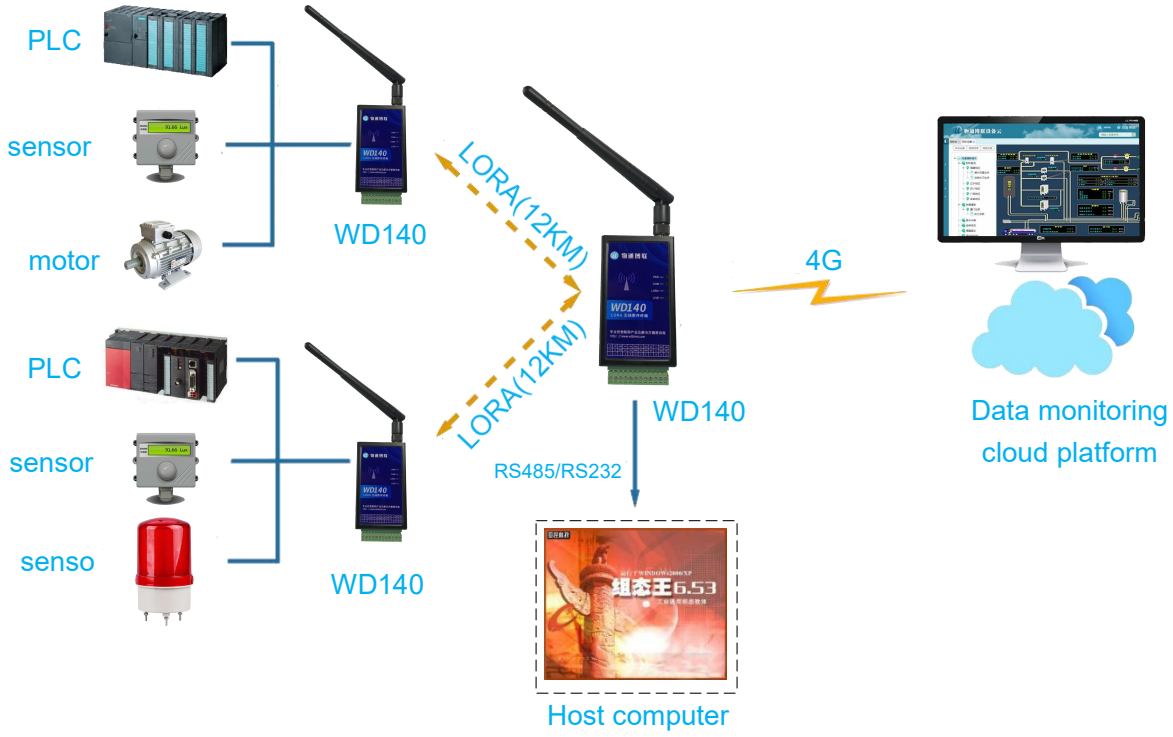


One-to-Many Wireless Transmission

One-to-Many transmission is also a common application mode in industrial acquisition. In the field, there are multiple acquisition points that need to summarize data to a controller or server. In industrial sites, the Modbus transmission protocol is generally used. Data from each node is obtained and each node is controlled through polling, or each node actively reports the collected data to the master node for processing, storage, and transmission.



The cloud platform reads the I/O of the WD140 and the data of the connected PLC through wireless LORA and the Internet.



Product Features

Abundant IO Data Collection Interfaces

1）Supports 2 - channel 12 - bit high - precision analog input, including current - type and voltage - type, and supports multiple ranges and ratio calculations.

2） Supports 1 - channel 0 - 60V digital input with selectable dry and wet contacts (dry contact by default, supports counter function).

3） Supports 1 - channel opto - coupled isolated transistor output.

Wireless LoRa Transmission Function (LoRa Version)

1） Embedded with a high - power, long - distance LoRa transmission chip, with a transmit power of up to 22dBm and a maximum transmission distance of 12KM.

2）Supports selectable frequency bands of 410 - 493MHz and 850 - 930MHz, which can be used both at home and abroad.

3） Can flexibly configure LoRa parameters such as channels, power, and air rate.

4） Supports setting the maximum frame length and timeout time, suitable for various data packet and corresponding speed scenarios.

Standard Modbus RTU Protocol

Supports the standard Modbus RTU protocol for local IO control and data acquisition.

Wireless 4G Data Upload to the Cloud (4G Version)

Supports uploading serial port and IO data to various cloud platforms and systems via the 4G network using the MQTT protocol.

Wireless Transparent Transmission Function

1）Supports wireless transparent transmission of 232 or 485 serial ports, as well as One-to-One and One-to-Many data transparent transmission.

2）Supports interference - free data transparent transmission with the coexistence of different systems.

3）Supports data caching function to improve transmission efficiency and adjust data packet segmentation.

High - Reliability Industrial - Grade Design

1）6 - 35V wide - voltage design and - 40 - +85° C wide - temperature design.

2）Isolated RS232 or RS485 design with 15KV ESD protection.

3）Opto - coupled isolated digital input, precise reference voltage, and high - reliability relay design.

4）Software and hardware watchdogs. Once an anomaly is detected, it can quickly diagnose and self - repair to ensure normal operation.

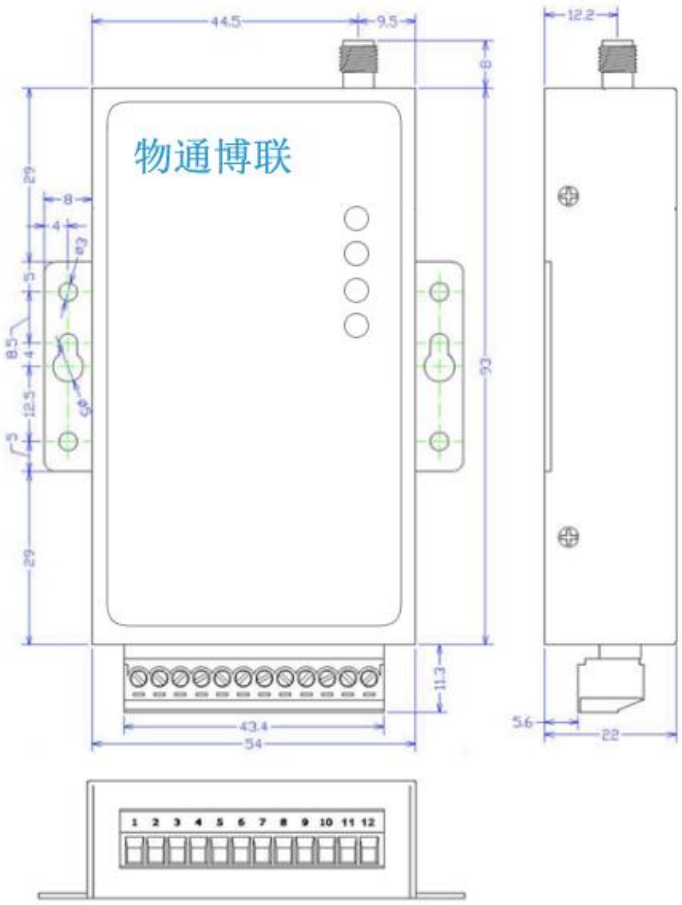
Product Specifications

Hardware specifications		
Hardware Platform	CPU Core	32 - bit Arm Cortex - M4
Interface Characteristics	Power Interface	DC 6V - 35V (terminal block)
	Serial Port	1 serial port (RS232/RS485), 15KV ESD protection, 1200 - 128000bit/s, default 19200
	Analog Input	2*12-bit acquisition accuracy AIs (selectable current - type and voltage - type), Current - type: 4 - 20mA, 0 - 20mA, Voltage: 0 - 5V, 0 - 10V, etc.
	Digital Input	1 channel opto - coupled isolated 0 - 60V input DI, supports counter function (dry contact by default)
	Digital Output	1 channel opto - coupled isolated digital output DO, with a load of less than 1A
	Antenna Connector	LoRa Antenna: SMA x 1 / 4G Antenna: SMA x 1
	SIM Card Holder	Straight - insert card holder * 1 (medium - sized card)
	Terminal Block	12*3.5mm
LoRa (Optional)	Working Frequency Band	410 - 493MHz or 850 - 930MHz optional
	Receiving Sensitivity	150dBm
	Transmit Power	22dBm
	Communication Distance	Maximum 12KM (recommended indoor 1 - 2KM, outdoor 4 - 6KM)
	Air Rate	0.48Kbps - 62.5Kbps (up to 300Kbps)
	Transmit Current	650mA
	LoRa Channels	6 configurable channels

4G (Optional)	Network Standard	LTE Cat1, maximum downlink rate 10Mbps, maximum uplink rate 5Mbps
Mechanical Characteristics	Dimensions	93x54x22mm
	Installation Method	Panel - mounted
	Shell	Black shell
	Protection Level	IP30
	Heat Dissipation Method	Fan - less heat dissipation
	Weight	260g
Device Power	Standby Power	200mA-240mA@12V
	Operating Power	250mA-290mA@12V
	Peak Power	300mA@12.0V
Environmental Humidity	Environment Humidity	5% ~ 95% (no condensation)
	Storage Temperature	-40℃~ 85℃
	Operating Temperature	-20℃ ~ 70℃
Indicators Lights	PWR	Power indicator
	COM	Serial port status indicator
	LORA	LoRa indicator
	LIVE	Operating status indicator
EMC Index	Electrostatic Discharge Immunity	GB/T17626.2 - 2018, level4
	Electrical Fast Transient Pulse Group Immunity	GB/T17626.4 - 2018, level4
	Oscillatory Wave Magnetic Field Immunity	GB/T17626.18 - 2016, level4

	Radio - Frequency Electromagnetic Field Radiation Immunity	GB/T17626.3 - 2016, level4
	Surge (Impact) Immunity	GB/T17626.5 - 2019, level4
	Power - Frequency Magnetic Field Immunity	GB/T17626.8 - 2006, level4
Physical Characteristics	Vibration	GB/T2423.10 - 2008
	Shock	GB/T2423.5 - 2019
	Drop	GB/T2423.8 - 1995

Product Size



Modbus Address

Modbus Address Mapping Table		
Category	Item	Address
Analog Input Sampling Values	AI0~AI1	40000、40001 (unsigned integer) 30000、30001 (unsigned integer)
Analog Input True Values	AI0~AI1	40050、40052(floating - point type) 30050、30052(floating - point type)
Digital Input	DI0	10000(Switching quantity)
Digital Output	DO0	00000(Switching quantity)

Product Selection

Hardware Selection	
Order number	WD140 - <N> - <I> - <S>
N (Uplink Network)	L (with LoRa module)/G (with 4G module CAT1)/W (with WIFI module)
I (IO Module)	M0211 (M represents module, 0 means no AO, 2 means 2 AIs, 1 means 1 DI, 1 means 1 DO)
S (Serial Port Type)	232: RS232 serial port; 485: RS485 serial port
Examples	WD140 - LM0211 - 485 Chinese frequency band: 410 - 493MHz LoRa, 485 serial port) WD140 - GM0211 - 485 (Chinese frequency band: 4G CAT1, 485 serial port) WD190 - LM0211 - 485 (Chinese frequency band: 850 - 930MHz, 22dbm, 485 serial port)

Company Introduction

Established in 2011, WideIoT is a leading provider of industrial Internet of Things products and industrial digital solutions. It focuses on offering products and solutions such as wireless data terminals, industrial intelligent gateways, equipment remote systems, and industrial application cloud platforms for equipment manufacturers, smart factories, and industry projects. It helps customers achieve digital operation management and tap new values in the industrial Internet.

The products of WideIoT are widely used in various industrial fields, including smart factories, equipment manufacturers, the environmental protection industry, the energy industry, municipal engineering, industrial automation, smart agriculture, and building intelligence. They are favored by top - tier domestic and foreign customers such as BOE, Foxconn, ASD, TCL, Schneider, Shanghai Electric, Shougang Group, Water Affairs Group, and Southern Power, as well as a large number of small and medium - sized enterprises.

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